

ABSTRACT

A system is disclosed for monitoring and controlling laser cladding process by powder injection in real-time. The invention combines laser cladding technique along with automated direct feedback control to achieve a good quality clad in terms of dimensional and metallurgical characteristics. The system uses optical CCD-based detectors as the feedback system. The optical CCD-based detectors along with a pattern recognition algorithm is used to determine the clad characteristics in real-time. These characteristics are clad's dimensions, solidification rate, and roughness that are fed into a closed loop control system to adjust the laser power and table velocity to produce desired clad quality.